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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/997,396	11/28/2001	Juha Hujanen	ASMMC.020AUS	2351
20995	7590	03/05/2004	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			VU, DAVID	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/997,396	Applicant(s) HUJANEN ET AL.	
	Examiner DAVID VU	Art Unit 2818	<i>aw</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2003.
- 2a) ☐ This action is FINAL.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 33-45 and 51 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-32, 52 and 53 is/are allowed.
- 6) ☒ Claim(s) 1-6; 8-9; 12-13; 46-50 is/are rejected.
- 7) ☐ Claim(s) 7, 10 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/28/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                     | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                            | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>16, 18 &amp; 19</u> . | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claim 47 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not include the sufficient description to allow one skill in the art to make and use “wherein the conductive layer is deposited by atomic layer deposition”.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 8 recites the limitation “wherein the elemental metal” in page 2 of “AMENDMENT TO THE CLAIMS”. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1-6; 9 and 12-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Sneh et al. (US 6,551,399)

In re claim 1-6; 9 and 12, Sneh et al., in related text (Col. 5, lines 35-42) and figure (Fig. 4), disclose a method for fabricating a metal M1 11(Col. 13, Lines 19-32)-insulator Al<sub>2</sub>O<sub>3</sub> 14-metal M2 15 (Col. 6, Lines 57-61) (M1/I/M2 capacitor) by performing atomic layer deposition (ALD). ALD is often described as a self-limiting process, in that a finite number of sites exist on a substrate to which the first species may form chemical bonds. The second species might only bond to the first species and thus may also be self-limiting. Once all of the finite number of sites on a substrate are bonded with a first species, the first species will often not bond to

other of the first species already bonded with the substrate. {See **Sneh (US 6,617,173)** (Col. 4; Lines 21-29) for evidence of the state of the art in which ALD process comprising alternating, self-saturating surface reactions.}

In re claim 13, wherein the first ferromagnetic layer M1 is thinner than the second ferromagnetic layer M2 (Col. 4, Lines 29-31 and Col. 5, Lines 25-34).

4. Claims 46 and 48-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Sneh et al. (US 6,551,399)

In re claim 46 and 48-50, Sneh et al., in related text (Col. 5, lines 35-42) and figure (Fig. 4), disclose a method for fabricating a magnetic memory cell comprising depositing a first ferromagnetic layer M1 layer (11) by ALD (Col. 13, Lines 19-32); depositing a conductive layer M1 (11) over the first ferromagnetic layer by ALD and depositing a second ferromagnetic layer M2 layer (15) by ALD (Col. 6, Lines 57-61). Note that the layer M1 (11) comprises of metals, metal nitrides or stack of metals and/or metal nitrides.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 49 is rejected under 35 U.S.C. 103)(a) as being unpatentable over Sneh et al. (US 6,551,399) in view of Sneh (US 6,617,173).

Sneh et al disclose all claimed subject matter, but fails to expressly mention the first ferromagnetic layer comprises NiFe and the second ferromagnetic layer comprises Co.

Sneh, in related text (Col. 4; Lines 58-60; Col. 5, Lines 51-54 and Col. 7, Lines 57-60) discloses the use of Ni, Fe, Co or their alloy for use in a FM/I/FM tunneling junction device. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Sneh et al. by using NiFe and Co as the FM material. The ordinary artisan would have been motivated to modify Sneh et al. in the manner described above for the purpose of using an equivalent material that is well known in the art.

### **Allowable Subject Matter**

6. Claims 7 and 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 14-32 and 52-53 are allowed.


The following is a statement of reasons for the indication of allowable subject matter: None of the references of record teaches or suggested a method of fabricating a magnetic memory cell, comprising: depositing a magnetic metal oxide layer over the dielectric layer by atomic layer deposition (ALD); and reducing the magnetic metal oxide layer to a magnetic elemental metal layer.

### **Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms., can be reached on (571) 272-1787.

DV

David Vu.

  
David Nelms  
Supervisory Patent Examiner  
Technology Center 2800